



## BOZEMAN WATER RECLAMATION FACILITY (WRF)

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NPDES # MT-0022608 & # MTG-650008

August 7, 2012

Mr. Christian Schmidt  
Senior TMDL Planner  
Montana Department of Environmental Quality  
1520 E. 6th Avenue  
P.O. Box 200901  
Helena, MT 59620

Dear Mr. Schmidt:

The City of Bozeman appreciates the opportunity to review the Draft Lower Gallatin Planning Area TMDL during this stakeholder's comment period.

Having reviewed this draft document, our overarching concern is that the nutrient component of this TMDL, as written, will become the precursor for regulatory criteria that will ultimately prove to be unattainable for both the City of Bozeman and MDEQ. Setting unattainable nutrient targets is likely to result in conflicts, added costs and increased public scrutiny for both levels of government. It would seem prudent to avoid this scenario if we can. Even when you consider the MDEQ's proposed variance process for municipal dischargers, it is ultimately not in the best interests of either party to establish TMDL standards for the East Gallatin River which cannot be achieved without going far beyond current limits of technology. Secondly, we are concerned that the upstream segments of the East Gallatin River have been identified as impaired without statistically significant data. This has the potential to drive the City's wasteload allocation to the numeric criteria applied end of pipe without the use of assimilative capacity modeling.

In the interest of moving this draft TMDL forward, we do concur that both the sediment and e-coli portions of the TMDL can be finalized with minimal changes. It is only the nutrient component of this TMDL that will ultimately present a significant challenge for both MDEQ and the City of Bozeman.

Therefore, we would like to offer the following proposal as a workable, more flexible alternative to the current TMDL approach for this watershed. The City of Bozeman would like to suggest we follow a two-phased approach to the Lower Gallatin TMDL, similar to the approach used for the Flathead TMDL. Phase 1 of the nutrient TMDL for the Lower Gallatin Planning Area could set wasteload allocations at our current, already reduced nutrient levels.

Then, a Phase 2 nutrient TMDL could be developed once additional stream sampling is conducted and after we, in partnership with MDEQ, have had time to develop a calibrated water quality model for all impacted stream segments.

The City of Bozeman is willing to collect the data necessary to support the analyses that MDEQ has indicated need to be done. A Sampling and Analysis Plan which will generate the data needed for a water quality model has already been sent to MDEQ for your review.

This Phase 2 nutrient TMDL could then overcome the following shortcomings we see in the existing document:

- As it is currently drafted, no water quality or chlorophyll data has been collected in the East Gallatin River since the City of Bozeman spent over \$53 million to upgrade and convert its Water Reclamation Facility to a 5-stage biological nutrient removal process.
- Algae data collected in 2008 and 2009 downstream of the City's outfall indicate algae densities were already below target concentrations prior to the upgrade. MDEQ has indicated three years worth of data are needed to present a viable water quality dataset. We agree. This third year of data is being collected by the City of Bozeman at this time.
- No water quality modeling has been done. We believe that this is bypassing a key element of water quality planning. There is little scientific evidence to help us understand whether nitrogen is the limiting nutrient in algae production, or whether phosphorus is the limiting nutrient, or perhaps both nitrogen and phosphorus are limiting. There is also no understanding of the impact of flow, light penetration, and other environmental factors. The City of Bozeman is willing to support the development of a calibrated water quality model at our expense.

We hope you'll consider this two-phased approach to the nutrient TMDL for the Lower Gallatin. We would like to meet with you at your convenience to discuss this approach in more detail.

Our detailed comments on the draft TMDL are as follows:

#### Executive Summary

- Page 2, first paragraph - If necessary nutrient reductions are achieved, then beneficial uses should be restored.
- For sediments and pathogens the impaired beneficial uses are identified. Please specifically identify the beneficial use(s) impaired by nutrients.

#### Section 1

- Table 1-1, please also include how the cause of impairment was determined.



## Section 2

- Please provide a complete and proper reference for the “Lower Gallatin Watershed Characterization Report”.

## Section 3

- Please link the TMDL (sediment, nutrients, and/or pathogen) to the streams and designated uses.

## Section 4

- Section 4.3 provides an example of how sediment TMDLs may be expressed. Please also include examples of how nutrients and pathogen TMDLs have and may be expressed.
- Please include a reference for the statement “DEQ also considers economic and social costs and benefits when developing allocations”.

## Section 5

- Regarding the MS4 Permit, use of the existing SWMM model is a very poor tool for developing the TMDL background load and proposed load allocations. The SWMM model was conducted on a very limited portion of the City’s MS4 system, is not representative of the entire MS4 system, and was not calibrated at the time of the original development. The data used and shown in Figures 5-5 and 5-6 are from our very limited DMR sampling and only uses the two sampling locations selected for our MS4 permit. Not only is the data set small, but the locations used are very limited in encompassing the characteristics of the City’s stormwater. The ‘industrial site’ sampled near our shops is consistently very high in pollutants and isn’t indicative of Bozeman stormwater.
- In addition, the City’s stormwater system is poorly mapped and incapable of being utilized for a system-wide stormwater model. If the Department utilized this model, please provide additional data indicating what modifications were made to the original model and associated calibration data. A synopsis of the changes should be included in the TMDL document and, at a minimum, input and output data from the model run should be included within an appendix at the end of the TMDL.
- A 62% reduction of sediments from commercial sites (37% reduction overall) will be difficult to achieve, especially given the fact that many of these sites have already been developed. The installation of BMPs at existing facilities is much more difficult than at new development or redevelopment sites due to existing grading and site constraints. New development and redevelopment is currently occurring very slowly given the condition of the current economy, and sediment reduction BMPs will not be installed at a rate that will meet reduction goals in a timely manner. We believe that a reduction of

62% of TSS from new development and redevelopment sites is more reasonable through the use of BMPs. In addition, the City will work within the MS4 to improve existing practices and implement new BMPs, where feasible, to further reduce the sediment load.

- We agree with the Department that using the BMPs described in the MS4 General Permit is the most effective way to minimize stormwater discharges, rather than implementing numeric loads. The City is committed to improving the MS4 and recently formed a stormwater utility. We agree that the proposed allocations can be satisfied by adhering to the MS4 permit requirements.

## Section 6

- Page 6-2, Section 6.3. Please define the difference between primary and secondary data sources, how this was determined and what it means for the assessment.
- Please describe how and what standards were used to review the data and deem the values relevant and credible to use for assessment.
- Page 6-5. Total Persulfate Nitrogen is not an EPA approved method for wastewater. Our MPDES permit (page 6 of 35) defines TN as the sum of nitrite + nitrate (as N) and TKN (as N) concentrations. Please clarify.
- Page 6-5. "The target concentrations of nitrogen and phosphorus are established at levels believed to prevent excess algae growth..." While we understand that studies indicate the numeric nutrient criteria are set to prevent excess algae growth, MDEQ is ignoring the fact that below the City's outfall, in two different rounds of sampling, excess algae growth was not present prior to the upgrade. Both lab data and photos taken at the time the samples were collected confirm this fact. We have every reason to believe that after our WRF upgrade algae densities are now even lower. MDEQ's assumption that the City of Bozeman needs to make an additional nutrient reduction of 94% beyond current performance levels is not supported by current algal density data.
- Page 6-5. "As numeric nutrient chemistry are established..." the verb should be "is".
- Page 6-6. Please include a figure of the TMDL Planning Area, waterbodies, and the ecoregions to make the following sections more understandable.
- Page 6-6. Section 6.4.3. In the following sentence, "Where water chemistry and algae data do not provide a clear determination of impairment status, or when other limitations exist, macroinvertebrate biometrics (HBI >4.0) are considered", please explain what is meant by a "clear determination". What was the evaluator's general definition or guidelines between clear and unclear? The text says the HBI was then considered, yet the text in the following sections for each waterbody seems to heavily



rely on the HBI for determining impairment rather than just being considered. The methodology described and the actual evaluations do not seem to match.

- Page 6-6. The paragraph between Tables 6-2 and 6-3 needs significantly more explanation. Exactly how the nutrient target values were set should be explained more explicitly. What does the following sentence mean and how was this done? "Water quality target values were used with relative flow contributions to calculate segment specific water quality targets." Please include a table or appendix showing the calculations.
- Page 6-11. Section 6.4.3.6. It seems counterintuitive to state that a TP TMDL is needed and then later state, "It does appear that the upper segment is not impaired for TP"? The structure of these waterbody sections should be reviewed and revised to present a more methodical and logical presentation of how the determinations of impairment and need for a TMDL was determined.
- Page 6-12. The second table in each of the waterbody evaluations is very misleading. For example, Table 6-15 for TP shows PASS, NA, and PASS, yet the "Indicates Impairment" column is YES. There should be a another column or a footnote for YES to indicate how the data passed the numerical tests yet the reach was still determined to be impaired.
- Page 6-12. Given that the upstream stretches of the East Gallatin River are listed as impaired for nutrients (TN and TP), the point source dischargers are then limited to the instream nutrient numeric criteria applied to discharge flow at the end of pipe (Section 6.6.1.1). This assumes no assimilative capacity in the River and is applied without any modeling or mixing zone. The Upper East Gallatin River stretch to the confluence of Bozeman Creek is listed as impaired, where none of the TP or TN samples exceed the numeric criteria, nor do the chlorophyll-*a* samples. The single macroinvertebrate sample exceeds the benchmark of 4 HBI by a value of 0.24. This is a tenuous argument to conclude impairment at best. In the Upper East Gallatin to the confluence of Bridger Creek, while there are TN and TP exceedances, the samples are very limited and statistical analysis is not possible. The chlorophyll-*a* samples are considerably below the target, and the two macroinvertebrate samples barely exceed the target of 4 HBI. By MDEQ's own analysis, there is limited data on the stretch of the River upstream of the WRF discharge, and without further analysis or modeling the numeric criteria is applied end of pipe. Due diligence indicates that further sampling and modeling should occur to ensure sensible application of the criteria and a mixing zone explored.
- Page 6-13. "For assessment purposes, data were not adjusted to reflect the October 2011 completion of Bozeman's upgrade to its WRF." Please explain why MDEQ would not assess the East Gallatin using post-upgrade analyses.
- Page 6-13. Table 6-17 the Target Value for TN does not seem to match Table 6-3.

- Page 6-14. MDEQ further supports an impairment listing by again, taking a limited dataset, four samples for macroinvertebrate HBI, taken in 2005, again prior to the upgrade, to support the impairment listing and the call for reduction in nutrients in its discharge.
- Page 6-14. In Table 6-18 it shows the chlorophyll-*a* data well below the nuisance algae threshold, but is then fails the algae test with a single AFDW sample.
- Page 6-15. We disagree with MDEQ's assessment that "the dataset clearly indicates nutrient impairment..." in the Lower Gallatin. The dataset includes three samples for chlorophyll-*a*, only one of which was above the nuisance algae standard, a single AFDW sample and two macroinvertebrate samples. A dataset this small could suggest that further data should be collected, but is too small to clearly indicate anything.
- Page 6-23. "the effect of winter grazing on vegetative health and its ability to uptake nutrients and minimize erosion in upland and riparian areas" has typos on capitalization and a period at the end, to be consistent with the other bullet points.
- Page 6-24. In Section 6.5.1.5, the discussion does not indicate if or how the age of the septic system was considered, please explain.
- Page 6-24. In Section 6.5.1.5, the first sentence states the MEANSS model was used to determine the septic loading. The last sentence of the second paragraph is unclear but seems to state that they were not used because of overestimation. Please revise and clarify what was done.
- Section 6.5.1.5. Please explain what is meant by "estimates do not take into account higher uptake rates" in regard to septic systems.
- Page 6-25. Please provide the MEANSS model described in this section.
- Page 6-26. Please note that at the moment, the Bozeman WRF is surpassing the plant's anticipated design criteria for performance. It is important to recognize that, to date, the plant's new thickening and dewatering systems have not been put into service and because we are not returning any sidestream flows to the head of the plant, and the plant is significantly underloaded. The Design performance for the facility is 7.5 mg/L TN and 1 mg/L TP. MDEQ should use these values in its analysis rather than our short term early performance values that are not indicative of long term performance expectations.
- Page 6-28. Section 6.5.2.2, including Table 6-39. Please revise the text to clarify what is meant by the term "allowable" in this section. Is this the allowable load in the MS4 permit or something else?



- Page 6-29. The data in Table 6-40 don't translate in a readily understandable way to the graphs shown on pages 6-31 to 6-35. Please explain how MDEQ translated these values to the percentages shown.
- Page 6-29. Section 6.5.3, please explain what the area-based evaluation approach is and provide a reference. Are these from land use based export coefficients? Why are some of the entries NA, and what does this mean?
- Page 6-30. Please provide the documentation for how the flows from the East Gallatin via Buster Gulch were derived and how the City's WRF flow component was determined. Similarly, please explain how the City's WRF flow component was determined to contribute to the Dry Creek irrigation canal. To the City of Bozeman's knowledge, no mixing zone study or other study has been done to determine what fraction of its flow makes it into these diversions, or what fraction of its nutrients makes it to their outlets given the irrigation uses and groundwater seepage along the route. Without this type of analysis, it would be impossible to say what fraction of the loads is transferred. If this analysis has been done, please provide it. If it has been done in the past, it most certainly would have changed with the plant's new outfall location.
- Page 6-33. Rearrange the callouts to be readable.
- Page 6-43. Equations 6-1 and 6-3 WGT should be WQT.
- Page 6-43. Would MPDES permits written to meet this criterion also allow a 20 percent exceedance rate? Please clarify.
- Page 6-45. Section 6.6.1.1. The reach immediately upstream of the discharge is not already consistently exceeding the standard. The approach applied assumes that the upstream reach always has nutrient concentrations greater than the selected target. The data in Section 6.4.3.6 show the upstream at times below the target. Bozeman should be provided a greater WLA to account for variability both in the upstream conditions and their treatment process. Additionally, a rate of 20-percent excursions (Section 6.6) above the target is allowed. This should be included in the computation of the Bozeman WRF WLA since nutrients are not toxic and because of the variability of conditions.
- Page 6-45. A "mixing zone approach is used to ensure that the discharge does not cause a standard violation." The City of Bozeman would like permission to implement a water quality model to develop appropriate wasteload allocations rather than the mixing zone approach described here. This would be similar to the approach that was used on the VNRP on the Clark Fork, which was approved by both MDEQ and USEPA. This approach is a much more suitable tool to develop important wasteload values rather than a simple mixing zone approach which was based on extremely limited data. It is for these reasons, the City of Bozeman is willing to support and fund the development of a water quality model.

- Page 6-45. This section should mention the fact that the City of Bozeman also moved its outfall with this upgrade which would naturally change mixing conditions in the river and its impact on the near field water quality.
- Page 6-46. Figure 6-15 should be expanded to show the City of Bozeman's current performance loads and an indication of MDEQs current limit of technology performance.
- Page 6-46. "There is no upper limit or load cap." This statement does not seem appropriate here. The idea that these numbers don't have a cap when they are so far away from what is technologically feasible seems disingenuous.
- Page 6-46. The latest version of MDEQ12 indicates that a 14Q5 will be used for this analysis rather than a 14Q10.
- Page 6-46. The 20-year expected flow to the City of Bozeman WRF is 13.9 MGD, not 8.5 MGD.
- Page 6-47. The sections on Total Phosphorus Discharge Limits and Total Nitrogen Discharge Limits need to be rewritten completely to describe the variance process. The City of Bozeman does not agree that it would need to have a facility designed to meet 0.07 mg/L TP and 4 mg/L TN by 2017. A facility designed to consistently meet those limits would represent a capital investment of more than \$30 million, beyond the \$53 million this community of 30,000 people has already invested. Given the very preliminary nature of the data used to develop this assessment, this section should be modified.
- Page 6-49, Section 6.6.1.2. Regarding the stormwater permit, the justification for the TN and TP load reductions (22% and 46%, respectively) required for the MS4 are not adequately discussed. Please provide additional justification (document citation or mathematical calculation) for these values.
- Page 6-51. Section 6.6.3, suggest removing "or something like that."
- Page 6-52. "Mass balance equations were used to reduce load estimates to reflect upgrades to the WRF." Again, as in the comment above mass balance equations are not the most appropriate tool for developing wasteload allocations intended to control algae growth. Rather, a water quality model would be a more appropriate tool to conduct this analysis.
- Page 6-52 and 6-53. It looks like these loads were calculated based on plant performance, rather than design performance as indicated above. In addition, these loads should be calculated using the 20 year flow for the facility, which is 13.9 MGD.



- Page 6-53. The 139 lb/d load referenced in Table 6-44 does not match the 244.79 lb/d referenced on page 6-26 and cannot be readily made congruent with Table 6-46. Please explain the discrepancy. Appendix F doesn't seem to clearly explain the loading from the WRF on various segments of the East Gallatin.
- Page 6-53. In Table 6-44, A TN allocation of 8.32 is not technologically feasible for the City of Bozeman WRF to achieve. Similarly, a TP allocation of 0.73 lb/d is not achievable in Table 6-45. Please provide an asterisk adjacent to these values and provide the current performance value and the technologically achievable value in a footnote so this is clear to the reader. The same comment applies to allocations for the WRF shown in Tables 6-48 and 6-49.
- Page 6-53. Table 6-44 calls for the City of Bozeman to further reduce its TN load by 94%. This seems like an inequitable distribution of reduction in the nutrient load in this watershed, given the significant financial investment the City has recently made. In fact, as shown in Table 6-44, subsurface dischargers would be allowed to discharge 15.7 lb/d TN with 0% reduction called for, while the City of Bozeman and its 30,000 residents are allowed only 8.32 lb/d TN.
- Page 6-53. Please explain how the "Subsurface Wastewater Treatment and Disposal" was derived. It does not appear to include a load from the leaking Riverside lagoons, which could represent a significant N and P, as well as an EColi load to the River.
- Page 6-54. Please explain how the City of Bozeman's existing TN and TP loads increase in the Lower Section of the River (257.37 lb/d, 39.55 lb/d) when compared to the middle section of the River (138 lb/d, 3.78 lb/d).
- Page 6-65. Section 6.6.4.1. Please explain where load duration curves were presented and how they demonstrated typical seasonal flow regimes.
- Page 6-66. "DEQ assumed that sampling data for each waterbody segment represents conditions in each segment. Most segments have less than the desired 12 samples, which increases the uncertainty of the representativeness of the data." This is exactly why we believe MDEQ should delay finalization of this document until better data and stream modeling can be completed to ensure the conclusions it draws are sound.
- Page 6-66. "DEQ assumed that background concentrations are less than the target values, and based on sample data upstream of known sources, this appears to be true. However it is possible that target values are naturally exceeded during certain times..." It is interesting to note that the source water to the City of Bozeman drinking water facility, with an average TP concentration of 0.06 mg/L would not be clean enough to discharge to the East Gallatin from its wastewater facility.
- Page 6-67. "One other area of uncertainty is the contribution from septic tanks." We also suggest that the existing Riverside sanitary sewer district load should be a

component of this calculation. Groundwater sampling for both TN and TP should be taken to better characterize this load. If groundwater data was used in this calculation, please provide it.

In conclusion, the City of Bozeman would sincerely appreciate the opportunity to meet with the MDEQ to discuss our concerns. This will allow us to work together to develop a TMDL that is based on a more comprehensive, two-phased approach. We believe it is clearly in the best interest of both parties to take the time to develop a properly calibrated watershed model before the nutrient section of this Lower Gallatin TMDL is finalized. We are confident that through continued discussion we can resolve the concerns we have voiced in this letter.

I look forward to continued communication and dialog with you and your staff. If you have any further questions or concerns please feel free to contact me at (406) 582-2924. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Adams", written in a cursive style.

Tom Adams,  
Water Reclamation Facility Superintendent  
City of Bozeman